JACOBSON (N.)

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SURGICAL tuberculosis, I take it, includes such forms of tuberculous disease as may be amenable to surgical treatment. Each year, as these pathologic conditions are better appreciated, the possibilities of surgical help increase.

Tuberculosis appears in various guises: Lupus is skin-tuberculosis; the connective tissue has its tuberculous abscesses; in the nose, mouth, and larynx it is seen as a primary affection, to say nothing of the lungs, where it is most frequently encountered. Tracing its course further along the mucous membranes, we find it invading the alimentary canal, appearing in the genito-urinary tract of both male and female, and awakening peritoneal infection. Again it is seen in the glandular structures, most frequently in the neck. The long and short bones, the joints, the spine are common sites of its occurrence. The special organs are not free. In fact, it would be difficult to suggest a structure in which it has not appeared as a primary disturbance. Diseases formerly called by other

[1] Read before the Onondaga County Medical Society, December 18, 1894, being part of the discussion on "Tuberculosis."

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names are now recognized as being tuberculous, under which head we might mention scrofula, caries, tumor albus, and hip-joint disease. Even the deeply placed organs, as the kidneys, the Fallopian tubes, and ovaries, do not escape the incursions of the tubercle bacillus. This enumeration, in itself very incomplete, suggests how inexhaustible must be the subject of the surgical treatment of tuberculosis. I can, therefore, present the disease in but a few phases, and, rather than attempt to consider its many different surgical forms, shall restrict myself to the discussion of the more frequently encountered varieties.

A brief preliminary word before we enter upon our specific task. No one to-day holds to the constitutional origin of tuberculosis. We must regard it as a local infectious disease, awakened by the introduction of the specific germ into tissues whose resistance has been lowered. That tubercle-bacilli can enter through unbroken mucous membranes is not to be questioned. Cornet presented the result of his experiments to the French Surgical Congress in 1889, in which he showed that tuberculous glandular swellings could be produced in guinea-pigs as the result of rubbing tubercle-bacilli into a mucous membrane without lacerating it. At the request of Volkmann, Schuchardt studied so-called scrofulous invasion of the skin and mucosæ presenting nothing unusual microscopically. In an instance of eczema of the forearm the bacilli were found between the scales of the epidermis. These points suggest the manner in which the local forms of tuberculosis originate.

However introduced, whether finding its way to glands through the mucous membrane, by way of the lymphatics, or discharged into the blood-current and locating itself as an embolic plug at a remote part of the body, the infection establishes itself first locally, heaping up its characteristic nodules, involving the surrounding structures, building up large fungous growths or forming caseous masses, ultimately producing local abscesses, or leading to constitutional disturbances. Again, it may awaken in the surrounding tissues reactionary inflammation, and secure thus a spontaneous arrest of the tuberculous process, while the bacilli and their spores, possessing remarkable vitality, may lapse as it were for a time in a state of "innocuous desuetude." Baumgarten discovered in autopsies made upon persons dying of other than tuberculous diseases, that one out of every four had latent tuberculous foci in the lungs. And so elsewhere in the body, the tuberculous areas may become quiescent, and particularly so under conditions favorable to such a result. Thus a tuberculous affection of the lungs or other structures need not necessarily lead in the first instance to death of the individual, nor in the latter to local necrosis.

Glandular Tuberculosis. Not all chronic enlarged glands of the neck are tuberculous. Much the larger percentage, however, of those that show no disposition to diminish, but remain latent or increase in size, and especially if they exhibit a tendency to suppurate, are tuberculous. The general physician has been accustomed to treat this latter condition with poultices. When the glands have

broken down and pus has reached the surface he makes an incision and gives vent to the purulent collection. Nature has to do the rest. No more unsurgical course could be pursued.

The tuberculous character of the glands being recognized, two lines of treatment are open: First, to secure the removal of the glands before the surrounding structures are involved; or, second, to wait until the structures are broken down, when we have to deal not only with glandular but also with periglandular inflammatory disease.

At the meeting of the British Medical Association, in 1893, it was the consensus of opinion of the section discussing this subject, that medical treatment in itself is of no avail beyond the benefits that come from improving the general tone. The early removal of the glands is advised, first, for esthetic purposes, as late removal of these structures leads to unsightly scars. But their removal for pathologic reasons is more to the point. If the glands can be excised without infecting the surrounding tissues, the wound can be closed, and union by first intention results. If a single gland is found caseous, the other glandular enlargements are probably in a similar condition, and their removal is desirable. Care should be taken to excise the glands entirely, as any tuberculous focus left behind will generate suppurative inflammation. The incision should be free enough to give access to all diseased masses. Some surgeons make a series of small incisions over the individual glands in order to avoid any apparent disfiguration. Others seek to establish a line of incision at a point where the scar will be least visible.

It is particularly to suppurative cases that I desire to call attention. To incise simply the abscess is not to lay bare the tuberculous focus. The diseased gland may simply be connected with it through a sinus. Again, one leaves behind the broken-down tuberculous mass a collection of infectious material. These cases demand free incision, thorough curetment with a Volkmann spoon, disinfection with a sublimate solution, and packing with iodoform-gauze. The danger of disseminating tuberculous disease by these steps is very small indeed. The operation for the excision of tuberculous glands, whether caseous or suppurative is a perfectly innocent procedure.

There is another phase in which these conditions should be regarded, that is, the danger, if allowed to remain, of remote infection by them. It is a common observation to see individuals with tuberculous glands develop at a later period pulmonary or other forms of tuberculosis. A child that was seen by me two years ago, with tuberculous lymphatics of the neck, and whose mother would not consent to their removal, this summer suffered from an extensive tuberculous iliac abscess.

Bone tuberculosis and Joint-tuberculosis. With the ever-increasing fund of knowledge, new principles in tuberculous disease of the bones and joints are being constantly established. It is therefore proper to refer again to this subject. Tuberculosis has a predilection for bones or portions of bones largely made up of cancellous tissue. So we have tuberculosis of the vertebræ or "Pott's disease," manifesting itself as a most frequent form

of bone-disease. Of the joints, because of the histologic structure of their bony constituents, the knee and the hip are most frequently affected. In four-fifths of the cases other tuberculous manifestations co-exist.

To diagnosticate the condition before the destructive stage of tuberculosis is reached is most essential. There is every reason to believe that we can arrest the lesions in their early stage. Allowed to suppurate, impaired function and deformity are the best result that can be attained. Chronic joint-inflammation requires surgical rather than medical treatment. Fixed points of tenderness, nocturnal pain, muscular rigidity, and particularly muscular atrophy, impaired function, changed position and form, are to be carefully noted.

Not only does timely treatment secure more serviceable extremities, but with their neglect tuberculous diseases of bones and joints may awaken remote infection. A case that I saw with Dr. Murray and reported by him, in which pulmonary tuberculosis followed upon tuberculous disease of the wrist-joint, exemplifies this. The close relationship between pulmonary tuberculosis and joint-tuberculosis is likewise evident in the subsidence of serious tuberculous lesions in the lungs upon removing a tuberculous joint. As an example of this kind I have to refer to a case seen by me in April, 1886. A tuberculous hip received conservative treatment, and the disease became quiescent. Subsequent traumatism reawakened the trouble; with the recurrence came hectic fever, night-sweats, emaciation, pulmonary invasion, and pulmonary hemorrhage.

On the 27th of April, 1887, I resected the hip. Despite the boy's reduced condition, he made a recovery, not only as to the condition of his extremity, but the pulmonary disease became retrogressive, disappeared, and he has remained well since, now seven years.

When the infectious character of bone-tuberculosis became recognized surgeons at once took the ground that the only course to be pursued was the removal of the tuberculous site. This led to an enormous number of minor operations and resections upon the bones and joints in search of the diseased area.

In the early period of tuberculous invasion of joints of the lower extremities nothing has accomplished so much as rest in the recumbent posture, with weight-extension. The period of time to be occupied by this treatment is much longer than is usually deemed necessary. Failure to observe this leads to failure of the treatment. Howard Marsh, one of the most earnest advocates of this line of procedure, states that the average period required for the cure of these cases is about eighteen months. He makes it a rule never to allow a patient to be up until at least three months have passed after the cessation of pain. He has found that the maintenance of the horizontal position for one or two years, in good air, with weight-extension, is not prejudicial to the patient's health. Only once I have found it necessary to continue the confinement in bed over one year. This boy improved in health steadily during the entire period.

When the disease has led to marked organic dis-

turbance, further steps become necessary. During the so-called antiseptic period, and until within a very recent period, operative intervention has been the accepted method for treatment. Under it, Schede and others, in the advanced cases, however, had a mortality of 66 per cent.

Tuberculin, when introduced, was claimed to be a panacea for all tuberculous affections. It was tried in cases of surgical tuberculosis. Much was expected, and its use became general, but in spite of the glowing accounts of its excellent qualities the mortality steadily increased until 75 per cent. of those treated with it who were suffering from tuberculous joint disease died. On the other hand, a line of procedure has now been instituted which has had most marvellous effects. It is the introduction into the joint of a sterilized solution of iodoform in glycerin or oil; 10 or 20 per cent. solutions are injected. Of the former, ten c.c., that is, two-and-three-quarters drams, and of the latter one-half that quantity is used. At the end of eight days a second injection is made. In the meantime cold applications are applied to the joint. Depending upon the severity of the case, the number of injections varies. Absolute contact with the diseased surface is necessary. Some discontinue its use, if no benefit follows four or five injections. This treatment has been pursued quite extensively in this country, and I have had not a little experience with it. The mortality has fallen to 20 per cent. under the iodoform-emulsion, and the number of resections has been reduced one-half. Upon this point the German surgeons are substantially agreed.

Bergmann, for example, prior to 1891, resected from thirty to forty hip-joints annually. During that year, with the same number of cases presenting themselves, he operated upon eleven. Of thirty-six tuberculous knee-joints, thirty-one were cured by injection, and only five had to be operated on. The fixed policy of the German surgeons to-day is not to resort to operative intervention until conservative measures have been given a fair trial.

In France Lannelongue has been using a 10 per cent. solution of zinc chlorid. Instead of injecting it into the joint, he applies it just outside of the diseased area, for the purpose of lighting up there, as Nature herself often does, a reactionary inflammation. He introduces a hypodermic needle into different points about the joint, as close to the attachment of the capsule to the bone as possible, until he has gone completely around it. Before the application the joint is placed in its normal position. The operation is done under antiseptic precautions, with the patient anesthetized. It is not repeated in less than three weeks. Other solutions have been used. One deserving mention is the suggestion of Landerer. In 1892 he began the use of a solution of cinnamic acid, five parts to ten of olive oil, the yolk of one egg, and 100 parts of a normal saline solution, rendered alkaline before its injection. Of all, however, the iodoform-emulsion alone has established itself securely with the profession.

As to the ultimate course of joint-tuberculosis, one of the most interesting studies presented recently is the report of Brans to the German Surgical Congress, last April. With Dr. Wagner he carefully

reviewed the records of the surgical clinic at Tübingen for the past forty years. Six-hundred cases of hip-joint disease had been treated during this period. Of these, upward of two-hundred are yet alive, and each was personally examined. That no doubtful case might be considered as tuberculous, all that ran a course of less than a year-and-a-half, or such as recovered without impaired function of the joint, were excluded. In this way the number was reduced to 390; 321 had been treated conservatively, and 69 by resection.

Tuberculous coxitis was found to be a disease appearing substantially during the first two decennial periods of life, 85 per cent. of the cases having occurred before the twentieth year. In one-third there had been no suppuration; in the other two-thirds abscesses and sinuses existed; 55 per cent. recovered under conservative treatment, the average period being four years; 40 per cent. died of tuberculous diseases of the internal organs. The appearance of suppuration increased the mortality 23½ per cent. The earlier in life the disease appeared the more favorable was found to be its course. Thus, 65 per cent. of those existing during the first decennium recovered; in the second 56 per cent; in the third and fourth 28 per cent., while no recoveries occurred in cases appearing after the fiftieth year. A number recovering from the tuberculous disease of the hip-joint succumbed later to other forms of tuberculosis. Those who as children had been severely sick, had been puny and wretched, after a period of from ten to thirty years were found to be perfectly healthy, vigorous, and, though deformed, did

not deserve the name of "cripples." Joint motion was restricted in all; in one-third it was partial; in two-thirds there was almost complete ankylosis. Faulty position existed, usually flexion with abduction, compensated to a certain extent by the pelvis. There was shortening, varying from one to twelve centimeters. Only a German surgeon would so thoroughly follow up a list of cases covering a period of nearly half a century and determine their ultimate outcome.

Peritoneal Tuberculosis. Permit me to glance hastily at another form of tuberculosis which, during recent years, has become amenable to surgical treatment. I refer to the peritoneal variety. Like forms of tuberculosis attacking other serous cavities, as the pleural or synovial, it is usually dependent upon a neighboring tuberculous focus. It may be associated with the genital tract in woman. Recently it has been discovered that conditions which had presumably been considered purely inflammatory, involving the ovaries and Fallopian tubes, are frequently tuberculous. Tuberculous peritonitis is not by any means restricted to adult life. Hartman, in 1892, collected, almost entirely from French literature, forty-eight cases in which children had been operated upon for tuberculous peritonitis, and only two of whom had died. The disease appears under different forms. First as ascites, in which the fluid is either clear or turbid or occasionally purulent. Here the serous membrane is found studded with miliary tubercles. A second variety presents thick adhesions, walling off this fluid into well-defined cavities and conveying the impression to the clini-

cian of the existence of a localized cystic tumor. In the third group the tissues are matted together, the intestines glued to one another, even to the degree of intestinal obstruction, ulcerated or perforated. The lymphatics are enlarged and caseous at times, but no fluid is present. Pressure may lead to extensive edema of the lower extremities. Such was the condition in a case that I have reported, in which the primary focus was located in a mid-lumbar vertebra, the retro-peritoneal glands being greatly enlarged and in which there co-existed tuberculous disease of the kidneys and bladder.

Medicinal treatment has proved of but little benefit, although cases have recovered without operation, in which the diagnosis of tuberculous peritonitis has been made. One such case I have seen. Henoch, however, laid down the rule that all cases of chronic peritonitis that recover spontaneously are not tuberculous. As opposed to the medicinal treatment in these cases, the benefits that have almost universally attended celiotomy have been one of the surgical surprises of recent times. How opening the abdominal cavity benefits this condition no one knows. The explanations offered are altogether too numerous to review. The profession is agreed only so far that celiotomy does cure. It seems to be more beneficial in the ascitic cases, whether the fluid be in the free peritoneal cavity or restricted by adhesions. It is of much less benefit in the third group, in which there is no fluid, but in which marked plastic disturbance exists.

The number of cases operated upon is very large. Unless there be general tuberculosis, the operation

is not contraindicated. Talleyrand has said statistics are but lying figures, yet probably the result is fairly stated by Koenig, who, in 1891, had collected one-hundred and thirty cases, with a death-rate of 3 per cent., and with a record of twenty-three improved and eighty four cured. Almost the earliest recorded case is that of Spencer Wells, operated in 1862. The patient, an unmarried lady, presented an abdomen distended to the size of a full term pregnancy. A cyst was suspected, but instead there was ascites, and the peritoneum was found studded with myriads of tubercles. The woman recovered, and now after more than thirty years remains free from any subsequent disturbance. A young lady upon whom I operated upward of four years ago remains perfectly well.

Genito-urinary Tuberculosis. The genito-urinary tract is found to be frequently the seat of primary tuberculosis. From the meatus to the supra renal capsule no tissue seems to have escaped primary invasion, while in both sexes the genital tract, at various points, has likewise been the initial site of tuberculous disease. Occurring in the urinary organs it is not always possible to establish a diagnosis, as the tubercle-bacillus is not readily found until the disease has advanced perhaps beyond operative relief. Schuchardt has remarked that tuberculous invasion is more frequently of venereal than of hematogenous origin. A mixed infection may exist when apparently only the characteristic sore of primary syphilis is present. Later the glands show that there has been tuberculous invasion. With gonorrhea, tuberculous epididymitis has occurred,

although the first appearance differs in no regard from ordinary gonorrhea, except that tubercle-bacilli are found associated with the gonococci. The introduction of tubercle-bacilli without laceration of the mucous membrane occurs, he claims, after the manner mentioned earlier in this paper. But, however, entering, the tubercle-bacilli have found in the genito-urinary organs sites most favorable for their development, and when awakened we have to deal with one of the most unfavorable forms of tuberculosis from a prognostic standpoint. When the primary manifestation is in the epididymis, or testicle, the only safeguard against further invasion is the removal of the tuberculous focus, which at least is possible in this situation.

An interesting case of this kind has been under my observation for fully ten years, in which the patient, a clergyman, has suffered from tuberculous disease of the epididymis, prostate, and bladder, and later of the sternum. Under conservative treatment he has been able to continue with his pastoral duties, and is indeed quite vigorous. On November 10, 1893, a patient who had presumably been suffering from an ordinary attack of gonorrhea since the preceding spring presented himself to me with a fistulous opening on the right side of the perineum. Flabby granulations existed at the opening, and the surrounding structures were infiltrated. His attending physician had diagnosticated an ischio rectal abscess. However the injection of hydrogen dioxid into the sinus found its way out of the urethra at the meatus. A close observation of the case led to the conclusion that it was associated

with deep-seated urethral tuberculosis. The wall of what had been a cold abscess and its fistula were curetted clear up to its prostatic commencement, and perineal section was peformed. The bladder was drained by a catheter carried through the perineal orifice for a month, during which period granulations sprang up, and the urethra was walled off from the old abscess-cavity. Slow convalescence followed, and in the course of six months the parts became thoroughly healed and remain so.

When the tuberculous site is higher up, that is to say, either in the bladder or kidney, the outlook is particularly unpromising. Removal of a tuberculous kidney, justifiable only when the disease is limited to one, is, as has been my experience, followed often by death from pulmonary tuberculosis. Nor is it always possible to determine where the primary focus is located. An example of this was found in a patient upon whom I operated at St. Joseph's Hospital, February 18, 1893, for an enormous iliac abscess of the left side. Both anterior and posterior openings were made and several quarts of pus evacuated. A coincident cystitis led me to believe that we were dealing with tuberculous disease of the urinary tract. The opinion was expressed that the kidney was probably the primary source of the infection. Our bacteriologist failed to discover tubercle-bacilli. Later on it became necessary to open through the acetabulum to secure better drainage. The patient improved sufficiently to return to his home. After a brief respite the disease again rapidly advanced, and the man died. Dr. Breese, who had attended him during his sickness,

was permitted to make an autopsy, and informed me that a fistulous tract crossed the body to the right kidney, which was disorganized by disease, while the left, upon the side corresponding to the abscess, was not involved.

This many-sided disease could occupy one indefinitely in merely superficially examining its various phases. I had expected to consider other forms in which the surgeon frequently encounters tuberculosis, but I have already occupied too much time.

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